

TOMORROW | DEC. 7, 2020

We Had the Vaccine the Whole Time

By David Wallace-Wells

In August 1957, Dr. Joseph Ballinger gave a nurse at a New York hospital the first H2N2-vaccine shot to be administered in the city. Photo: AP Photo/AP2009

You may be surprised to learn that of the trio of long-awaited coronavirus vaccines, the most promising, Moderna's mRNA-1273, which reported a 94.5 percent efficacy rate on November 16, had been designed by January 13. This was just two days after the genetic sequence had been made public in an act of scientific and humanitarian generosity that resulted in China's Yong-Zhen Zhang's being temporarily forced out of his lab. In Massachusetts, the Moderna vaccine design took all of one weekend. It was completed before China had even acknowledged that the disease could be transmitted from human to human, more than a week before the first confirmed coronavirus case in the United States. By the time the first American death was announced a month later, the vaccine had already been manufactured and shipped to the National Institutes of Health for the beginning of its Phase I clinical trial. This is — as the country and the world are rightly celebrating — the fastest timeline of development in the history of vaccines. It also means that for the entire span of the pandemic in this country, which has already killed more than 250,000 Americans, we had the tools we needed to prevent it .

To be clear, I don't want to suggest that Moderna should have been allowed

to roll out its vaccine in February or even in May, when interim results from its Phase I trial demonstrated its basic safety. “That would be like saying we put a man on the moon and then asking the very same day, ‘What about going to Mars?’” says Nicholas Christakis, who directs Yale’s Human Nature Lab and whose new book, *Apollo’s Arrow*, sketches the way COVID-19 may shape our near-term future. Moderna’s speed was “astonishing,” Christakis says, though the design of other vaccines was nearly as fast: BioNTech with Pfizer, Johnson & Johnson, AstraZeneca.

Could things have moved faster from design to deployment? Given the grim prospects for winter, it is tempting to wonder. Perhaps, in the future, we will. But given existing vaccine infrastructure, probably not. Already, as Baylor’s Peter Hotez pointed out to me, “Operation Warp Speed” meant running clinical trials simultaneously rather than sequentially, manufacturing the vaccine at the same time, and authorizing the vaccine under “emergency use” in December based only on preliminary data that doesn’t track the long-term durability of protection or even measure the vaccine’s effect on transmission (only how much it protects against disease). And as Georgetown virologist Angela Rasmussen told me, the name itself may have needlessly risked the trust of Americans already concerned about the safety of this, or any, vaccine. Indeed, it would have been difficult in May to find a single credentialed epidemiologist, vaccine researcher, or public-health official recommending a rapid vaccine rollout — though, it’s worth noting, as early as July the *MIT Technology Review* reported that a group of 70 scientists in the orbit of Harvard and MIT, including “celebrity geneticist” George Church, were taking a totally DIY nasal-spray vaccine, never even intended to be tested, and developed by a personal genomics entrepreneur named Preston Estep (also the author of a self-help-slash-life-extension book called *The Mindspan Diet*). China began administering a vaccine to its military in June. Russia approved its version in August. And while most American scientists worried about the speed of those rollouts, and the risks they implied, our approach to the pandemic here raises questions, too, about the strange, complicated, often contradictory ways we approach matters of risk and uncertainty during a pandemic — and how, perhaps, we might think about doing things differently next time. That a vaccine was available for the entire brutal duration may be, to future generations trying to draw lessons from our death and suffering, the most tragic, and ironic, feature of this plague.

For all of modern medical history, Christakis writes in *Apollo’s Arrow*, vaccines and cures for infectious disease have typically arrived, if they arrive, only in the end stage of the disease, once most of the damage had already been done and the death rate had dramatically declined. For measles, for scarlet fever, for tuberculosis, for typhoid, the miracle drugs didn’t bring rampant disease to a sudden end — they shut the door for good on outbreaks that had largely died out already. This phenomenon is called the McKeown hypothesis — that medical interventions tend to play only a small role compared to public-health measures, socioeconomic advances, and the natural dynamics of the disease as it spreads through a population. The new coronavirus vaccines have arrived at what counts as warp speed, but not in time to prevent what CDC director Robert Redfield predicts will be “the

most difficult time in the public-health history of this nation,” and do not necessarily represent a reversal of the McKeown hypothesis: The country may still reach herd immunity through natural disease spread, Christakis says, at roughly the same time as the rollout of vaccines is completed. Redfield believes there may be 200,000 more American deaths to come. This would mean what Christakis calls a “once-in-a-century calamity” had unfolded start-to-finish between the time the solution had been found and the time we felt comfortable administering it. A half a million American lives would have been lost in the interim. Around the world, considerably more.

In weighing other risks and uncertainties, Americans have been much less cautious, and not just in the case of marching maskless into Wal-Marts. On March 28, on what would normally be considered very thin evidentiary ground, the FDA issued an emergency-use authorization for the drug hydroxychloroquine. On May 1, it issued an EUA for remdesivir. On August 23, it issued another for convalescent plasma (the practice of injecting antibodies from the blood of recovered patients into those sick with the disease). These were all speculative authorizations — gambles, without concrete evidence, that existing treatments which scientists and doctors had some reason to suspect might help with the treatment of COVID-19 would be both safe and effective. All of these bets were lost. None of them, in the end, proved effective. Hydroxychloroquine, famously, proved dangerous, too, increasing risk of death in patients receiving it. Just one drug, the steroid dexamethasone, has proven to be a worthwhile treatment for COVID-19 in a randomized control trial — though given too early, it too can be dangerous. And at least some of the threefold decline in COVID-19 fatality rates observed over the spring and summer, the University College of London disease geneticist Francois Balloux told me recently, can be attributed to doctors no longer trying so many experimental treatments and focusing instead on the basic, old-fashioned job of simply keeping patients alive.

The treatment dilemmas facing physicians and patients in the early stages of a novel pandemic are, of course, not the same as the dilemma of rushing a new vaccine to a still-healthy population — we defer to the judgment of desperate patients, with physicians inclined to try to help them, but not to the desires of vaccine candidates, no matter how desperate. An unsafe vaccine, like the one for polio that killed ten and paralyzed 200 in 1955, could cause medical disaster and public-health backlash — though, as Balloux points out, since none of the new coronavirus vaccines use real viral material, that kind of accident, which affected one in a thousand recipients, would be impossible. (These days, one adverse impact in a million is the rule-of-thumb threshold of acceptability.) An ineffective vaccine could also give false security to those receiving it, thereby helping spread the disease by providing population-scale license to irresponsible behavior (indoor parties, say, or masklessness). But on other matters of population-level guidance, our messaging about risk has been erratic all year, too. In February and March, we were warned against the use of masks, in part on the grounds that a false sense of security would lead to irresponsible behavior — on balance, perhaps the most consequential public-health mistake in the whole horrid pandemic. In April, with schools already shut, we closed playgrounds.

In May, beaches — unable or unwilling to live with even the very-close-to-zero risk of socializing outside (often shaming those who gathered there anyway). But in September, we opened bars and restaurants and gyms, inviting pandemic spread even as we knew the seasonality of the disease would make everything much riskier in the fall. The whole time, we also knew that the Moderna vaccine was essentially safe. We were just waiting to know for sure that it worked, too.

None of the scientists I spoke to for this story were at all surprised by either outcome — all said they expected the vaccines were safe and effective all along. Which has made a number of them wonder whether, in the future, at least, we might find a way to do things differently — without even thinking in terms of trade-offs. Rethinking our approach to vaccine development, they told me, could mean moving faster without moving any more recklessly. A layperson might look at the 2020 timelines and question whether, in the case of an onrushing pandemic, a lengthy Phase III trial — which tests for efficacy — is necessary. But the scientists I spoke to about the way this pandemic may reshape future vaccine development were more focused on how to accelerate or skip Phase I, which tests for safety. More precisely, they thought it would be possible to do all the research, development, preclinical testing, and Phase I trials for new viral pandemics before those new viruses had even emerged — to have those vaccines sitting on the shelf and ready to go when they did. They also thought it was possible to do this for nearly the entire universe of potential future viral pandemics — at least 90 percent of them, one of them told me, and likely more.

As Hotez explained to me, the major reason this vaccine timeline has shrunk is that much of the research and preclinical animal testing was done in the aftermath of the 2003 SARS pandemic (that is, for instance, how we knew to target the spike protein). This would be the model. Scientists have a very clear sense of which virus families have pandemic potential, and given the resemblance of those viruses, can develop not only vaccines for all of them but also ones that could easily be tweaked to respond to new variants within those families.

“We do this every year for influenza,” Rasmussen says. “We don’t know which influenza viruses are going to be circulating, so we make our best guess. And then we formulate that into a vaccine using essentially the same technology platform that all the other influenza vaccines are based on.” The whole process takes a few months, and utilizes a “platform” that we already know is basically safe. With enough funding, you could do the same for viral pandemics, and indeed conduct Phase I trials for the entire set of possible future outbreaks before any of them made themselves known to the public. In the case of a pandemic produced by a new strain in these families, you might want to do some limited additional safety testing, but because the most consequential adverse effects take place in the days right after the vaccine is given, that additional diligence could be almost immediate.

According to Florian Krammer, a vaccine scientist at Mount Sinai, you could do all of this at a cost of about \$20 million to \$30 million per vaccine and, ideally, would do so for between 50 and 100 different viruses — enough, he says, to functionally cover all the phylogenies that could give rise to

pandemic strains in the future. (“It’s extremely unlikely that there is something out there that doesn’t belong to one of the known families, that would have been flying under the radar,” he says. “I wouldn’t be worried about that.”) In total, he estimates, the research and clinical trials necessary to do this would cost between \$1 billion and \$3 billion. So far this year, the U.S. government has spent more than \$4 trillion on pandemic relief. Functionally, it’s a drop in the bucket, though Krammer predicts our attention, and the funding, will move on once this pandemic is behind us, leaving us no more prepared for the next one. When he compares the cost of such a project to the Pentagon’s F-35 — you could build vaccines for five potential pandemics for the cost of a single plane, and vaccines for all of them for a fraction of the cost of that fighter-jet program as a whole — he isn’t signaling confidence it will happen, but the opposite.

Krammer spent the early months of the pandemic focused on serological testing — it was his lab that gave New York City its first clear picture of just how far the pandemic had spread through the five boroughs in the spring— but recently, he has turned his attention to how to accelerate the timeline of vaccine delivery. In [a just-published paper in *Cell*](#), he suggests it isn’t just that Phase I clinical work and the larger, longer Phase II safety trials which could be done preemptively, entirely before the arrival of new pandemics. Some Phase III efficacy testing, he says, could be done then, as well — especially for existing rather than novel strains. “To look for immunogenicity”—whether scientists can provoke the right immune response — “you don’t even have to develop the vaccine,” he says. “You can make antigens in the research center and just test it — that’s pretty inexpensive.” And if a Phase III trial were deemed necessary, it could start just weeks after the disease was identified and conclude in as soon as ten weeks.

If we do all that, he says, the entire timeline could be compressed to as few as three months. The production and distribution of a vaccine adds considerable cost, bureaucracy, and even some chaos, as we’re likely about to see. But three months from the design of the Moderna vaccine was April 13. The second and third surges, the return to school and the long-dreaded fall, 225,000 more deaths and 50 million more infections — all of that still lay ahead. Shave another month off somehow and you’re at March 13, the day the very first person in New York City died.

**This article appears in the December 7, 2020, issue of New York Magazine.*

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 69 COMMENTS

THE **Intelligencer** FEED

6:11 P.M. IMPEACHMENT**Trump Lawyers Dismiss Impeachment as ‘Political Vengeance’: Live Updates***By* INTELLIGENCER STAFF

Attorneys for former President Trump concluded their defense, using only three of their 16 allotted hours.

**5:37 P.M.** THE NATIONAL INTEREST**Trump’s Defense: What About Democratic Violence? (Answer: There Wasn’t Any.)***By* JONATHAN CHAIT

His impeachment lawyers focus on whataboutism.

**4:58 P.M.** COVID-19**Herd Immunity May Be Out of Reach — But Normality Is in Sight***By* ERIC LEVITZ

The virus may keep circulating indefinitely, but the vaccines appear robust enough to turn all COVID variants into minor ailments.



MOST POPULAR

1. Firing Actors for Being Conservative Is Another Hollywood Blacklist*By* JONATHAN CHAIT**2. The Lincoln Project Is Accused of Protecting Sexual Predator John Weaver***By* MIRANDA GREEN**3. How Long Can COVID Cases Keep Plummeting?***By* DAVID WALLACE-WELLS**4. Trump’s Treatment of Pence During Capitol Riot Was Even Worse Than We Knew***By* BENJAMIN HART**5. Trump Was More Sick With COVID Than White House Let On: Report***By* MATT STIEB**4:12 P.M.** IMPEACHMENT**The Timeline for Trump’s Second Impeachment Trial***By* ED KILGORE

The schedule and structure have been set, and the whole thing could be over in less than a week.

**3:57 P.M.** POLITICS

Biden Aide Threatened to ‘Destroy’ Reporter Asking About His Girlfriend*By* EVE PEYSER

TJ Ducklo, a White House spokesperson, accused the reporter of being “jealous” he was with another journalist after she poked into his love life.

**3:15 P.M.** IMPEACHMENT**Trump’s Defense for Inciting the Mob: Everybody’s Fighting!***By* ED KILGORE

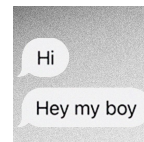
A video of Democrats saying the words *fight* or *fighting* was put together by his lawyers, likely for Trump’s entertainment.

**2:58 P.M.** SHOTS**Giving Vaccines to Prisoners Won’t Be Enough to Get Prisoners Vaccinated***By* REBECCA MCCRAY

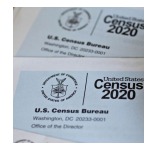
“We just don’t want to be the lab rats.”

**2:28 P.M.** POLITICS**The Lincoln Project Is Accused of Protecting Sexual Predator John Weaver***By* MIRANDA GREEN

John Weaver used his power to get jobs for young men he allegedly harassed. His colleagues were warned.

**12:41 P.M.** PARTISAN GERRYMANDERING**Census Delays Could Create Havoc and Skulduggery in Redistricting***By* ED KILGORE

Lack of timely Census data could short-circuit court challenges to partisan gerrymandering, which Republicans in particular are expected to pursue.

**11:08 A.M.** PIVOT**The Kindler, Gentler Twitter***By* INTELLIGENCER STAFF

Kara Swisher and Scott Galloway think Donald Trump’s absence has already made the platform a healthier place.

**9:48 A.M.** THE NATIONAL INTEREST**Firing Actors for Being Conservative Is Another Hollywood Blacklist***By* JONATHAN CHAIT

What is the principled difference between barring communists and barring conservatives?



8:25 A.M.**Capitol riot footage unveiled at the impeachment trial raised new concerns about Pence's "nuclear football"**

Military officials overseeing the authorization process to launch nuclear weapons were unaware on January 6 that then-Vice President Mike Pence's military aide carrying the "nuclear football" was potentially in danger as rioters got close during the violent Capitol insurrection, according to a defense official.

... US Strategic Command became aware of the gravity of the incident after seeing a video played at the Senate impeachment trial Wednesday showing Pence, his Secret Service agents and a military officer carrying the briefcase with classified nuclear launch information running down a flight of stairs inside the Capitol to get to safety, the official said.

... Since they never lost control of the "football" and then-President Donald Trump was safe, they didn't have to deactivate Pence's system. But the incident raises the question of whether the "football's" status was sufficiently accounted for at all times.

"The risk associated with the insurrectionists getting their hands on Pence's football wasn't that they could have initiated an unauthorized launch. But had they stolen the football and acquired its contents, which include pre-planned nuclear strike options, they could have shared the contents with the world," Kingston Reif, an expert on nuclear weapons policy at the nonpartisan Arms Control Association, told CNN.

"Such an outcome would have been a security breach of almost incomprehensible proportions," Reif added. "And it ought to raise further questions about the rationale for the anachronism that is the football."

Military officials were unaware of potential danger to Pence's 'nuclear football' during Capitol riot

—CNN

7:00 A.M. THE CITY POLITIC**Nobody Knows How NYC's New Voting System Will Affect the Mayoral Race**

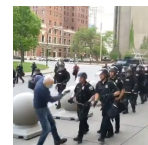
By DAVID FREEDLANDER

Ranked-choice voting could be a major factor in the contest. But insiders just shrug when it comes to specifics.

**2/11/2021** POLICE BRUTALITY**Criminal Charges Dropped Against Buffalo Cops Who Shoved 75-Year-Old Protester**

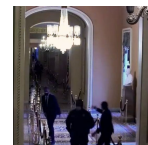
By MATT STIEB

A grand jury dismissed felony assault charges against two officers who shoved an elderly man to the ground at a Black Lives Matter protest last June.

**2/11/2021** IMPEACHMENT TRIAL**Impeachment Is Literally Congressional Self-Defense in Trump's Case**

By ED KILGORE

It's the only way Congress can defend itself against executive abuses of power — this time, it's was physical.

**2/11/2021** DONALD TRUMP**Trump Was More Sick With COVID Than White House Let On: Report**

By MATT STIEB

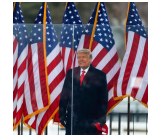
The day he was hospitalized in October, Trump's blood oxygen reportedly dipped to an alarming level as he developed other lung problems.

**2/11/2021** IMPEACHMENT TRIAL

Trump's Conduct on January 6 Was Not Just Wrong: It Was Stupid

By ED KILGORE

Trump went nuclear at precisely the moment when it no longer made any sense.



2/11/2021 GULP

Could the Florida Water-Supply Hacking Happen in New York City?

By ALISSA WALKER

Good news: There are a lot of checks and tests that go on here. But that doesn't mean we're careful enough.



2/11/2021 MONEY!

How to Find Your Missing Stimulus Checks

By EVE PEYSER

If you didn't get the first or second one, there's good news: You might still! The bad news is that you'll have to go through the IRS.



2/11/2021 CORONAVIRUS STIMULUS

The Fed Gives Democrats the Green Light on Large Stimulus

By ERIC LEVITZ

The central bank is worried about Congress stimulating the economy too little, not too much.



2/11/2021 CAPITOL RIOT

Trump's Treatment of Pence During Capitol Riot Was Even Worse Than We Knew

By BENJAMIN HART

The president learned his veep was in danger, then almost immediately castigated him on Twitter.



2/11/2021

Impeachment probably won't have serious consequences for Trump, but two long-simmering tax issues might

One is a massive income tax refund Trump received before entering office, according to the New York Times, one that has quietly been under a years-long review by the Internal Revenue Service and a little-known congressional panel, the Joint Committee on Taxation.

The refund, which the IRS issued to Trump in 2010 for \$72.9 million, according to the Times, could be a nonissue for Trump if the agency rules that it was issued appropriately and he should keep the funds.

But if the agency rules against him, he could be asked to pay it back with interest, handing him a debt of more than \$100 million at a time when some of his biggest properties are suffering severe revenue losses and the law firm that handled his tax issues cut ties with him following the attack on the U.S. Capitol.

... Steven M. Rosenthal, a tax expert who worked for the Joint Committee on Taxation in the 1990s, said he was not surprised that the IRS and the committee didn't issue a decision while Trump was in office. He said it's more likely they'll move forward now.

"The outcome of all this may be a huge liability for Donald Trump," Rosenthal said. "This is real money."

The other issue Trump faces is the possibility that Democrats, after five years of trying, will finally pry free Trump's tax returns now that the party controls both Congress and the White House. Leading House Democrats are still pursuing a lawsuit seeking six years of Trump's returns. On Feb. 3, a federal judge gave officials in the Biden administration until

March 3 to decide whether it plans to comply.

Now out of office, Trump may have to face tax questions

—Washington Post

2/11/2021 REOPENING



How NYC's Bars and Restaurants Are Preparing for the Return of Indoor Dining

By RACHEL SUGAR

"We're not thrilled about it."

2/11/2021 PANDEMIC

How Long Can COVID Cases Keep Plummeting?

By DAVID WALLACE-WELLS

There's a mysterious element to the good news.



2/10/2021 DEPARTMENT OF JUSTICE

Trump DOJ Blocked Search Warrant for Investigation Into Rudy Giuliani: Report

By MATT STIEB

The Department of Justice reportedly stalled on a request for a warrant to see Giuliani's records regarding his time in Ukraine until Biden took over.



2/10/2021 GEORGE FLOYD

William Barr Rejected Plea Deal for Cop Who Killed George Floyd: Report

By MATT STIEB

Last June, Barr stopped a deal giving Derek Chauvin a ten-year sentence because he felt that protesters around the nation would see it as too lenient.



2/10/2021 BIDEN ADMINISTRATION



Tanden, Republicans Agree That Bernie Sanders Is Not an ‘Ignorant Slut’*By* ERIC LEVITZ

Biden’s OMB nominee — and Left Twitter’s archnemesis — is having a very normal confirmation hearing.



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olaf.klischat 1 MONTH AGO (Edited)

That's what I've been asking myself for months now -- what would happen if a new respiratory virus emerged with the same infectiousness as SARS-CoV2 and the same lethality as Ebola (IFR 50%). Meaning, a potentially civilization-ending pathogen. And let's say this virus would turn out to be just as "accessible" to vaccine development as SARS-CoV2 is, i.e. there would be very promising vaccine candidates after just a few weeks. Would the FDA and other authorities around the world still insist on their standard approval procedures, taking many months to conduct and review preclinical and clinical trials in three phases while the world crumbled around them? Do we have any official, institutional answers to these questions at all?

LIKE 👍 REPLY ↩

REPORT 🚩

joaniel 1 MONTH AGO

Remember when the Obama Admin. had to DEAL w/an Ebola outbreak?

LIKE 👍 1 REPLY ↩

REPORT 🚩

swilliams3 1 MONTH AGO

And handled it like a BOSS!!

LIKE 👍 REPLY ↩

REPORT 🚩

kfaher175 1 MONTH AGO

Gosh... you didn't know HOW stupid people are? Has not the advent of Donald Trump managed to enlighten you to the abysmal ignorance of the average American? Has the proliferations of conspiracy and falsehood, FOX, Qanon, and NewsMax, not spelled out for you the limitless potential for humans to prefer the cozy embrace of the nostalgic and makebelieve, to the cold certainty of science and fact? Nothing you have written here surprises me OR informs me of things I had not previously known. America's Ship of State is a vast enterprise requiring compromise and consensus among a crew of imbeciles. Human Beings are, by their very nature, a vast mass of plodding bovine dullards drifting aimlessly toward their doom. Poor Dr. Atlas; if only he had know that the Herd Immunity he so desperately brayed[sic] for had already been acquired long eons past, at the very beginning of Homo Sapiens: an immunity to knowledge! An immunity he acquired while attending Medical school, apparently.

LIKE 👍 REPLY ↩

REPORT 🚩

sbw78721 1 MONTH AGO

It is truly **staggering** to me how many of these commenters seem not to have read—or at any rate, understood—the article. The main points are that:

(1) previous vaccine development (SARS) **laid the groundwork** for the Moderna vaccine to be **developed mere days** after SARS-CoV2 was sequenced; and



(2) proactive R&D and updated regulatory procedures could establish safe, **standard vaccine 'platforms'** that may reduce the interval between vaccine development and Phase III efficacy trials during future pandemics.

The author is *not* suggesting that we should or even could have started deploying *these particular vaccines* in February or March—given what we had in place at the time.

Furthermore, the notion that researchers or politicians 'held back' vaccines in order to harm Trump politically is unfounded at best and a paranoid conspiracy at worst.

I will, however, grant that various left-leaning pundits and influencers appear far more eager to 'follow the

I will, however, grant that various left-leaning pundits and influencers appear far more eager to 'follow the science' in areas where Trump flouts it (e.g. with masks and social distancing) than in areas where Trump is eager to claim rather more credit than he is (individually) due, as he does with the vaccines.

LIKE  2 REPLY 

REPORT 

canceltime 1 MONTH AGO *(Edited)*

Obviously it was Bill gates fault. But wait, it was just today that my conspiracy crazy cousin said, don't take the one from Moderna because Bill Gates is behind it.

I don't believe many of the assumptions in this article. I also question why too many people seem so egocentric believing everything was withheld from the world to hurt Trump.

I voted for Trump in 2016 and had my reasons. Trump did well with some of my reasons but failed miserably as a leader. His narcissistic nature, his messianic complex and child like twitter grew old. You can only be a junk yard dog before someday you will need to stop forward and lead.

When Trump started the theme that Covid was overblown and a Democratic hoax, me and my colonel friend couldn't believe it. I told my sister then and there that Trump just lost the election. Around the world Covid marched and trump pretended it was going away soon. Well it didn't. As a leader Trump could have at least talked to the people telling them that yes, masks are not 100% effective but they do help. Instead he refused to wear one and his minions followed his example.

It wasn't massive fraud that did it but it was very bad, very poor leadership that cost him the election. People poured out of the cracks to vote against him. Just like I felt in 2016 when I would have crawled over glass to vote against Hillary there were people who felt the same this time but this time it was Trump.

Not a Biden supporter and no longer supported Trump so I voted Libertarian.

LIKE  1 REPLY 

REPORT 

kfaher175 1 MONTH AGO

You have accomplished little with this comment other than to identify yourself as an idiot.

LIKE  REPLY 

REPORT 

crocko 1 MONTH AGO



Crock O'

LIKE  REPLY 

REPORT 

wxxwhite 2 MONTHS AGO



Some good insights and observations but overall - garbage pseudo retrospective science reporting. Preposterous assumptions. I doubt the author has ever "done" real science or conducted a clinical trial. I read this for a non science (or rather tried).

LIKE  2 REPLY 

REPORT 

ethernot 2 MONTHS AGO



The only ones who “held the truth” as well as deliberately lied and pushed disinformation was your fascist idol and his lickspittles; the lives of over three hundred thousand—and counting—are on *their* hands, no one else’s.

LIKE  2 REPLY 

REPORT 

Normsailor 2 MONTHS AGO



I take it the author and the quoted doctors have volunteered themselves and their families to be first in line to be vaccinated. What heroes!

LIKE  2 REPLY 

REPORT 

jreach 2 MONTHS AGO

This headline is so irresponsible.

LIKE  6 REPLY 

REPORT 

davifraci 2 MONTHS AGO



get used to it ,j . the shitshow has hardly begun
free biden !

LIKE  REPLY 

REPORT 

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Hydroxychloroquine does NOT kill unless you overdose just like aspirine could kill you!

LIKE  3 REPLY 

REPORT 

kjt 2 MONTHS AGO

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